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Study Of Obstetric Cases Needing Admissions In Icu And Ricu

B Neelima[1], P Padmavathi[1], P Rabbani Begum [1]
1-Associate professor (OBG)

Government Medical College , Kadapa
,AndhraPradesh,India

Corresponding Author : Dr B. Neelima, Associate Professor ,OBG Department, Government Medical College , Kadapa

Abstract
Background : *Pregnancy is a physiological condition resulting in a pathologic sequences Pregnancy can cause life threatening complications as a result of disorders related to pregnancy or due to pre existing medical diseases which may require ICU admissions. In such situations , a multidisciplinary approach is essential requiring criticalcarephysicians,obstetricanesthesiologists,obstetricians,obstetricphysicians,fetalmedicinespecialists,neonatologists,andconcernedspecialists for successful maternal and neonatal outcomes .The main objectives of this study were :*
1.To Identify primary causes of obstetric cases that need ICU admission.2. To describe the clinical presentations and contributing factors ofobstetric cases needing ICU admissions.3. To document maternal and perinatal outcomes of pregnant women admitted to the RICU and ICU.
Methods*: A prospective observational study was conducted from May 2021 to May 2022. The study comprised of 120 obstetric cases admitted to Obstetric ICUand RICU. After taking informed consent from patient attenders, patients name,age, address wasrecorded, clinical examination was done, routine and specific investigations were done. Glasgow coma scale and APACHE II score were determined and necessary treatment was started and monitored. Statistical analysis: The data collected was entered into Microsoft excel spread sheet and analysed using Statistical Package for Social Sciences (SPSS24). Descriptive data were presented in the form of frequencies, percentages, mean and standard deviation. The Student's 't'-test or Independent 't' test and Chi-square test was used to compare various study outcome. P value< 0.05 was considered as statistically significant.*
Results:*Among the causes for admission into obstetric ICU, 37.5% were due to eclampsia and 19.2% were due to PPH. 27.5% study subjects required mechanical ventilation. Of 25% of patients who were kept on inotropes, 80% survived. The mean APACHE and GCS scores and the outcome had a statistically significant relationship (p=0.001 and p=0.003, respectively).*
Conclusion: *APACHE score and GCS score significantly predicted the adverse maternal outcome.*
Key words: *Intensive care unit, APACHE Score, GLASGOW scale*

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I. Introduction

Inthe1960s, theideaandadvancement ofemergency carein allfacets of medicine and surgery had its start. Guidelines for ICUs were set bytheCriticalCareMedicineSocietyin1989and1998aftertheNationalInstitutesofHealthhostedtheConsensusConferencein1983.

Pregnancyisaphysiological process that can result in pathologic conditions. A few of thespecial features of pregnancy include the contact between the uterus and theplacenta, a physiological strain that can cause the emergence of pathologicdisorders and a maternal-fetal interface capable of having an effect on bothlives concurrently or independently. Pregnant women may suffer from life-threatening illnesses as aresult of disorders or diseases associatedwithpregnancy or as a result of increased pre-existing problems. Hence a multidisciplinary approach is essential from

criticalcarephysicians,obstetricanesthesiologists,obstetricians,obstetricphysicians,fetalmedicinespecialists,neonatologists,andconcernedspecialists for successful maternal and neonatal outcomes forparturientadmittedtoamaternalcriticalcarefacility.

Indeveloped countries,0.9% to 1% of expectant mothers require admission to a maternal critical careunit. However, in our country, the admission rates for critically ill antenatal mothers rangefrom3%to8%.Despite a recent trend toward decline, maternal death rates in India continuetoberelativelyhigh.AccordingtoIndia'sNationalFamilyHealthSurvey (2019–2021),there has been a decinmaternaldeathrates(per100,000livebirths), from 254 in 2004–2006 to 113 in 2016–2018. [1]

Specializedcareisnecessaryfor pregnancyconditions,likeantepartumhemorrhage, preeclampsia and its associated complications, severe anemia, ormultipleriskfactors atthe timeofadmission which may require caesarian section. However, many antepartum admissions are for non-obstetric causes,such as diabetes, pyelonephritis, thyrotoxicosis, asthma, pneumonia, or heartdisease. [2]Surgerymayberequiredincasesoflife-threatening hemorrhage, and accessibility to a delivery room and operatingroomiscrucial.Thisclosecontactisidealforthefetalhealthofantenatalmother, becausemany of themare delivered prematurely.[2]

Among all patients admitted to intensive care units, pregnant women have better prognosis as they areyoung and in good health. Obstetricians and other healthcare professionalsmustbeawareoftheseuniqueconsiderations. [3]

Identifyinga pregnantpatientwhoisseriouslyunwell

The Confidential Enquiry into Maternal and Child Health in the UnitedKingdommadecleartheimportanceofmaternalearlywarningscoresystems for obstetric patients, as well as the early detection and treatment ofseverely ill pregnant patients. [4] For both the mother and the child to have afavourable prognosis, early diagnosis of a serious sickness is crucial. It'spossiblethatprognosticfactors,suchtheSequentialOrganFunctionalAssessment (SOFA) score, predict death less accurately during pregnancythan for non-pregnant. Thismay bedue to pregnancy-relatedphysiological changes, such as an increase in heart rate, a change in whiteblood cell count, or even a drop in the frequently present creatinine levels.Delivery typically results in a notable improvement in the disease course and a decreased mortality, even when initial signs indicate a high mortality. [5]There are numerous classifications for obstetric risks associated withillnesses. The Shock Index (SI), which is defined as the ratio between heartrateandsystolicbloodpressure,hasbeenproposedasausefulandreliable tool to predict hypovolemic states and early hemodynamic compromise (suchasmajorobstetrichemorrhage)inobstetricpopulations,evenwhentheindividual vital signs are within normal ranges. While a score of >1.4 indicatesthe need for rapid stabilization or intervention and transfer to a tertiary carefacility,ascoreoflessthan0.9indicatesaminimalriskofsignificantresuscitation.

TheminiPIERS(Pre-eclampsiaIntegratedEstimateofRisk)riskprediction model of pre-eclampsia can be used to quickly identify pregnantwomenwhoareatanincreasedriskofdyingorsufferingmajorproblems.Thismodeltookintoaccountfactors whichincluded,parity(nulliparityvs.multiparty),gestationalageatadmission,headache/visualdisturbances,chestpain/dyspnea,vaginalbleedingwithstomachpain,systolicbloodpressure, and dipstick proteinuria. Forthismodel, lab tests likeplatelet count, serum creatinine, lactate dehydrogenase,aspartate transaminase, andalanine amino transaminasemust be done.

Thefreshlycreatedobstetricallymodifiedquick-SOFAscore(omqSOFA) can now be evaluated without awaiting the outcomes of biochemicalorlaboratorytestingbecauseitjust requires clinical data. [5]

qSOFA score modified for pregnancy (qSOFA with obstetricmodifications)

Clinicalparameter	**Score**
Systolic blood pressure ≤90 mmHg (≤100 mmHg In nonpregnantpatient)	**1**

Respiratoryrate≥25/min(≥22/mininnonpregnantpatient)Alteredmentation1(anystateotherthanalert)(GlasgowComaScale)	**1**

(SOFA–Sequentialorganfailureassessment;Infection+omqSOFA≥2–maternalsepsis;

omqSOFA –Qsofawith obstetricmodifications)

ManagementGuidelinesforaCriticallyIllPregnant

A sick pregnant patient should undergo the same evaluation as aseriously unwell non-pregnant patient. After assessing the patient's airway,breathing, and circulation (ABC) conditions, the appropriate degree of care isselectedforherandacritical carepathwayisformed.[4]

Care levels*:*

Patients at Level 0 are those whose needs can be met by standardward care, Level 1 are at risk of worsening and require a higher level ofobservationor haverecently beentransferred from higher levelsofcare,Level 2 are in need of invasive monitoring or intervention and support for asinglefailing organsystem (advanced respiratory supportis excluded fromthiscategory), and Level3 arein need of advanced respiratoryassistance.

The care pathways for critically ill pregnant women include levels 2, 3,and 4 of critical care. A life-threateningpregnancy related clinicaldeteriorationthatmaybereversibleisrecognizedand transferredtotheappropriatelevel.

The term "mobilematernal critical care unit" is justified by the provision of level 2 critical care inahighdependencyunitatdeliveryroomofamaternitycenter.Critical care atlevels 3 and4isprovidedina criticalcareunit. [4]

HighDependencyUnitsforObstetrics/ObstetricIntermediateCareUnits(H.D.U):

These units are within of the labour and delivery suites. The standardsfor intermediate and intensive care are included. Nurses trained in criticalcare andspecialistsinmaterno-fetalmedicinegive thecare.

PregnantWomen'sIntensiveCareUnit

These are full-service intensive care units, however they are run byobstetricsandanesthesiaspecialists.

II. Materials & Methods:

The study was conducted after getting approval from Institutional Ethics Committee. The institutional ethical committee approval number is 35/2021

A prospective study was done over a period of 1 year from May 2021 – May 2022 on 120 women admitted to Obstetric ICU.Instuitional Ethics Committee Approval number – Lr no- 35/2021

Inclusioncriteria:

Pregnant women irrespective of gestation period and/or within 42 daysof delivery admitted in any one of the above 2 centres with documentedneedforintensive care,monitoringand interventions.

Exclusioncriteria:

Pregnancies associated with surgical complications such as appendicitis,hernia, cholecystitis.

After valid written informed consent, the following data was recorded:name, age, sex, address, pathological condition for admission in ICU,diagnosis,generalandclinicalexaminationandvitalparameters weremonitored.

Investigations namely complete blood count, liver function tests, renalfunction tests and serum electrolytes (i.e., sodium, potassium, calcium,phosphates,magnesium)randombloodsugar,arterialbloodgas,erythrocytesedimentation rate, blood culture[±])wereperformed.

Other factors like hypotension on admission (±), need for ventilatorysupport (±), ionotropic support (±), cardiac failure ±), hepatic failure (±),renal failure (±) and duration of ICU stay till either the patient wasdischargedfromICUorexpired werealsonoted.

All the patients were given ICU care appropriate for thediseasecondition.

Appropriate antibiotics were given according to the prevalent sensitivity pandchangedas perthe culturesensitivitypattern.

Interventions like central venous line insertion in hypotension, cardiacfailure etc., endotracheal intubation, ventilator support in respiratorydistressorfailurewereperformed.

Supportive therapy was given to these patients as follows: nutrition was maintainedwithIVfluidsandRyle'stubefeedingindrowsyorunconscious patients and oral feeding in conscious patients, severeanaemia was treated with packed cell transfusion and DIC with freshfrozenplasma(FFP)andblood±platelets,renalfailurewithhemodialysisorconservativemanagement,hypoglycemiawithdextroseinfusions,metabolicacidosiswithsodiumbicarbonateadministration or dialysis. Thetreatmentstrategywasindividualizedforeachpatient.

STATISTICALANALYSIS

The data collected was entered into Microsoft excel spread sheet andanalyzed using Statistical Package for Social Sciences (SPSS24). Descriptivedatawerepresentedintheformoffrequencies,percentages,meanandstandard deviation.Based on whether the data is following parametric or non-parametric distribution. The Student's 't'-test or Independent 't' test and Chisquare test was used to compare various study outcome. P value< o. o5 wasconsidered asstatisticallysignificant.

III Results:

Table 1:Socio demographic factorsinsurvivorsandnonsurvivors

Age(Years)			**Outcome**		**Total**	**P - Value**
			Survivors	**Non Survivors**		
Age Group	**≤ 29**	**Count**	80	9	89	0.01
		%	74.8%	69.2%	74.2%	
	> 29	**Count**	27	4	31	
		%	25.2%	30.8%	25.8%	
Total		**Count**	107	13	120	
		%	100.0%	100.0%	100.0%	
Education status			**Survivors**	**Non Survivors**	**Total**	**P- Value**
	Educated	**Count**	61	7	68	0.02
		%	57.0%	53.8%	56.7%	
	Uneducated	**Count**	46	6	52	
		%	43.0%	46.2%	43.3%	
Total		**Count**	107	13	120	
		%	100.0%	100.0%	100.0%	

The p value was 0.01 which was significant and thus indicated a higher survival rate in women aged above 29 years.

The P value was 0.02 and was statistically significant. 46.2% of the uneducated patients did not survive compared to the 53.8% of educated non survivors.

Table 2: Causes of admission in Obstetric ICU

Cause of ICU Admission		Frequency	Percentage
Valid	**PPH**	23	19.2
	Post Partum Eclampsia	21	17.5
	Sept.c shock	2	1.7
	Placental Abruption	8	6.7
	HELLP	2	1.7
	Ruptured Ectopic	10	8.3
	Hyperemesis	2	1.7
	Antepartum Eclampsia	24	20.0
	Hypovolemic shock	3	2.5
	Rheumatic Heart disease	6	5.0
	Epilepsy	2	1.7
	Pulmonary Edema	3	2.5
	DIC	1	0.8
	Post Partum Cardiomyopathy	8	6.7
	Placenta Previa	5	4.2
	Total	120	100.0

Most common cause for ICU admission was antepartum eclampsia (20%) followed by PPH (19.2%) and then postpartum eclampsia (17.5%)

Table 3: Ventilator use in survivors and non survivors

	Outcome			
			Total	**P – Value**

Use of Ventilator			**Survived**	**Not Survived**		
Ventilator	**Ventilator**	**Count**	30	3	33	0.003
		%	28.0%	23.1%	27.5%	
	Non Ventilator	**Count**	77	10	87	
		%	72.0%	76.9%	72.5%	
Total		**Count**	107	13	120	
		%	100%	100%	100%	

The p value was less than 0.003 and was statistically significant.

Patients on ventilator were seen to have a higher mortality rate compared to those who were not on ventilator.

Table 4: Inotropes use in survivors and non survivors

			Outcome		**Total**	**P – Value**
			Survivors	**Non Survivors**		
Inotropes	**Inotropes**	**Count**	24	6	30	0.04
		%	22.4%	46.1%	25.0%	
	Non Inotropes	**Count**	83	7	90	
		%	77.6%	53.9%	75.0%	
		Count	107	13	120	

Total	**%**	100%	100%	100%	

The p value was less than 0.04 and was statistically significant. 25% of the patients on inotropes did not survive.

Table 5: Mean Comparison between APACHE Sore &GCS with outcome

Outcome		**N**	**Mean**	**Std. Deviation**	**P - Value**
APACHE score	**Survived**	107	9.93	6.75	0.001
	Not Survived	13	10.23	5.82	
GCS	**Survived**	107	13.29	3.39	0.003
	Not Survived	13	12.77	3.90	

The P value was less than 0.05 and hence was statistically significant.

indicating that both scoring systems were good in predicting maternal

outcome.

IV Discussion:

Life-threatening problems can arise in any pregnant woman with littleor no warning.In March 2016, National Guidelines for Obstetric ICU/HDU werecreated and published. The organization of obstetric ICUs and HDUs, as wellas the needs for human resources, admission standards, and ICU and HDUlayouts, were thoroughly explained in this guideline.

When fully operational Obstetric ICUs are built, primary data from these facilities will have a very high impact and significantly lower maternal mortality.

The current study was conducted from May2021 to May 2022. 120 women admitted to the intensive care unitwere studied during this period after obtaining approval from Institutional Ethics Committee.

Table 1

In present study, it was found that 25.8% of participants were <29 years, while 74.2% of participants above >29 years. A study conducted in Bangalore by Rathod et al., over a 3-year period in 2016 showed that of 765 obstetric admissions, 56.20 percent were between the ages of 20-25 years and 22.61% of participants between the ages of 26-30 years. [6]

In present study, 56.7% of cases admitted to Obstetric ICU were educated while 43.3% were uneducated. It was found that patients with less education had greater rates of maternal and perinatal mortality. On the other hand, in a prospective observational study conducted by Urvashi Migliani et al.from July 2017 to December 2018, 39.5% of the 124 obstetric ICU were uneducated. [7]

This demonstrated that literacy was a significant deciding factor as educated patients were in a better position to identify potential danger symptoms during pregnancy and seek immediate medical attention

Table 2

In present study, 37.5% eclampsia (antepartum & postpartum) cases and 19.2 %PPH cases were the major causes of admissions in Obstetric ICU.

Similar results were observed by TS Ntuli et al ,Pietersberg Hospital's ICU in Limpopo, South Africa. from 1st January 2008 to 31st December 2012. Of a total of 138 cases admitted to Obstetric ICU, preeclampsia and eclampsia were majority of cases. [8]

Similar conclusions were derived by Maria Vargas et al, in a retrospective cohort analysis with 66 obstetric patients who had been hospitalized at the ICU at the University of Naples between January 2008 and December 2013. They observed that the primary causes of ICU admissions were HELLP syndrome and hypertension disorders. [9]

Between 1997 and 2002, a study was conducted by Anwari et al at Armed Forces Hospital in Riyadh, Saudi Arabia, 99 obstetric patients were admitted to the ICU. Haemorrhage and hypertension were found to be the two most frequent reasons for admitting obstetric patients to ICU. [10]Invasive hemodynamic monitoring and ventilator support were the two major therapies.

Table 3 &4

In the present study, 25% patients were given inotropes, while 27.5% patients were put onmechanical ventilation. Additionally, it was observed that mechanically ventilatedpatients who did not receive inotropes, survival rate was less than non-ventilated patientsand this difference in survival was statistically significant.

In a retrospective study done by Heena Gupta et al in North India, from October 2018 to March 2020, 127 obstetric cases were admitted to ICU of which 38.58% patients were provided mechanical ventilation. [11]A retrospective audit of obstetric admissions was done by Crozier et al in which they enrolled 60 obstetric ICU admissions. They observed that 45% of women required mechanical ventilation. [12]

Table 5

In present study, the mean APACHE II score for survivors was found to be 9.93, while it was 10.23 for non-survivors.

Cohen et al. conducted a 4-year a retrospective case series study among 46 obstetric admitted patients to ICU and found one death in 46 patients from an ICU in Israel. The median APACHE II score was 6+3.9(mean 7.24). [13]

Lapinsky et al. conducted a retrospective review of 65 obstetric admissions and observed no deaths in 65 Canadian ICU patients. The mean APACHE II score was 6.8 +/- 4.2. [14]

In each investigation, the observed fatality rate was substantially lower than the anticipated mortality rate. Despite being widely utilized, the APACHE II proved to be a superior predictor when applied to patients in non-obstetric intensive care. [13] Though the topic is still being debated, majority of the ICU services continue to follow the APACHE II protocol.

A cohort study carried out by B. Rao Bahadur et al in Guntur, Andhra Pradesh from October 2014 to September 2016. in the Medical Intensive Care Unit (MICU) of a tertiary care teaching hospital in India found that mortality was significantly higher for patients with a GCS of 10 at the time of admission(85.3%) than for patients with a GCS of more than 10 (9.1%). [15]

V Conclusion:

In the present study, eclampsia and PPH were the mostcommon obstetric conditions that resulted in ICU hospitalization.Regular antenatal visits help in early identification of complicationsand prevent ICU admissions or treat them thus decreasingmaternal mortality.

The judicious use of ventilator support and inotropes will have a significantfavourable maternal outcome.

APACHE score and GCS score significantly predict the adversematernal outcome.

VI References

1.Sanusi AA, Osinaike B, and Amanor-Boadu SD. Experiences with

obstetric intensive care in underdeveloped nations. Int J Anesth. 2006 Jan

1;10.

2. Critical Illness in Pregnancy: Part II: Common Medical Conditions Complicating Pregnancy and Puerperium, by Guntupalli KK, Karnad DR, Bandi V, Hall N, and Belfort M. 2015 November;148(5):1333-45 in Chest.

3.Schaufelberger M. Cardiomyopathy and pregnancy. Heart. 2019 Oct;105(20):1543–51.

4. Pandya ST, Mangalampally K. Critical care in obstetrics. Indian J Anaesth. 2018 Sep;62(9):724–33.

5. R. Cantwell, T. Clutton-Brock, G. Cooper, A. Dawson, J.Drife, D. Garrod, et al Reviewing maternal mortality to make pregnancy and childbirth safer: 2006–2008. The Eighth Report of the Private Investigations into Maternal Deaths in the UK 2011 Mar;118 Suppl 1:1-203 in BJOG Int J Obstet Gynecol.

6. Study of Obstetric Admissions to the Intensive Care Unit of a Tertiary Care Hospital. RathodAT, Malini KV. 2016 October;66(Suppl 1):12–7. J Obstet Gynaecol India

7.AsmitaMuthalRathore and DeeptiVerma. Admissions of pregnan patients to a critical care unit in a tertiary hospital in northern India. 2014May in International Journal of Biomedical Research (09).

8. Pathak AP, Miglani U, Laul P, Sarangi S, Gandhi S, Miglani S, and Laul A. A prospective hospital-based study of the clinical profile and fetomaternal outcome of obstetric patients admitted to the intensive care unit. Peerreviewed, the official publication of the Indian Society of Critical Care Medicine is the Indian Journal of Critical Care Medicine. 2020 Nov;24(11):1071.

9.Iacovazzo C, Schiavone V, Vargas M, Marra A, Bonanno P, and Servillo G. A 5-Year Retrospective Study of Obstetric Admissions to an ICU in a Tertiary Care Facility. 2019 May;23(5):213-9. Indian J Crit Care Med Peer-Rev Off Publ Indian SocCrit Care Med.

10. Admissions for obstetrics to the intensive care unit. American Journal of Obstetrics and Gynecology.

11. Profile of obstetric patients in intensive care units: a retrospective research from a tertiary care facility in North India, by Gupta H, Gandotra N, and Mahajan R. Peer-reviewed, official publication of the Indian Society of Critical Care Medicine; Indian Journal of Critical Care Medicine; 2021 Apr;25(4):388.

12. Obstetric admissions to an integrated general intensive care unit in a quaternary maternity facility. Crozier TM, Wallace EM. 2011 Jun;51(3):233-8. Australian and New Zealand Journal of Obstetrics and

Gynaecology

13. Course and outcome of obstetric patients in a general intensive care unit. Cohen J, Singer P, Kogan A, Hod M, Bar J. 2000 January 1;79(10):846-50. ActaObstetricia et GynecologicaScandinavica.

14. Course and outcome of obstetric patients in a general intensive care unit. Cohen J, Singer P, Kogan A, Hod M, Bar J. 2000 January 1;79(10):846-50. ActaObstetricia et GynecologicaScandinavica.

15. Study of outcomes of obstetric emergencies admitted to intensive care units. Bahadur BR, Kodey P, Tanniru J, and Tirumala S. 35. Obstet Gynecol, Int J Reprod Contraception. 2018 July